Alaska Department of Fish and Game
State Wildlife Grant
FINAL PERFORMANCE REPORT

Grant Number: T-1 **Segment Number:** 6
Project Number: 6
Project Title: GIS mapping of terrestrial ecosystems in Southeast Alaska
Project Duration: July 1, 2004 – June 30, 2006
Report Period: July 1, 2005 – June 30, 2006
Report Due Date: September 30, 2006
Partner: The Nature Conservancy

Objectives:

1. Develop a GIS database and map of terrestrial ecosystems in Southeast Alaska;
2. Conduct a retrospective analysis to evaluate climatic/geologic/landform characteristics associated with previously logged areas;
3. Conduct a GAP analysis of ecosystem types in areas protected under the Tongass Land Management Plan, Alaska State Forest Practices Act, and other statutes.

Summary of Accomplishments: The following summary covers accomplishments from the project's inception.

The following accomplishments relate to Objective 1:

1. Completed a regional GIS database of existing vegetation in Southeast Alaska based on USFS timber inventory, and augmented by USGS Interim Landcover Map (ILC) and Landsat ETM for non-Tongass lands within the region. USGS ILC data were current in the late-1980's but currently remain the best available data for large areas of Southeast Alaska not within the Tongass National Forest. Many changes in land cover in these areas since this time were documented with Landsat ETM, current in 2000 – 2002. Areas logged since the late-1980's were clearly visible using Landsat and were superimposed upon the previous forest condition represented in the USGS ILC data.
2. Compiled a regional map of Landform Associations based primarily on USFS Soils database. Gaps in data from non-TNF lands and Wilderness areas within the Tongass were filled using a supervised classification of elevation, slope and topographic position index based on signatures developed in areas with photo-interpreted landform data.
3. Completed a GIS map illustrating the terrestrial ecosystem classification and a report detailing methods and results of the GAP analysis have been completed.

The following accomplishment relates to Objective 2:

4. Completed retrospective selectivity analysis of historic logging in Southeast Alaska. This analysis was designed to address the extent to which the highest volume (big-tree) forest stands have been high-graded in Southeast Alaska. We examined this question using a selectivity analysis of the distribution of forest types available in comparison with the distribution of forest types logged (% use / % availability). At

the stand level, data were available on the composition of forest types logged since 1986. Data were not available from the earliest days of industrial logging in Southeast Alaska, when fewer environmental regulations allowed much greater access to large-tree riparian and other forests. Thus, our estimate of the proportion of large-tree forests logged is very conservative. Secondly, we conducted a landscape-level analysis to compare the proportional representation of productive forest lands among landform types with the proportion of logging that occurred. Finally, we also compared the distribution of logging activity with the distribution of productive forest lands among biogeographic provinces. These 3 analyses indicate that: (1) at the stand level, logging activity has been directed toward the largest tree forests disproportionate to their availability; (2) at the landscape level, low-elevation valley floor and karst forests have been logged disproportionate to their availability; and (3) at the regional level, some of the most productive provinces (e.g., North Prince of Wales, Dall / Long Island) have been logged disproportionate to the availability of productive forest lands.

The following accomplishments relate to Objective 3:

5. Completed a regional GIS data layer of land ownership and management for Southeast Alaska by integrating data from the Tongass National Forest Land Status, Land-Use Designations under the Tongass Land Management Plan, Alaska Dept. of Natural Resources Land Status, and tidelands estimated using an integrated bathymetry map developed by The Nature Conservancy and NOAA Auke Bay Lab. Further, conservation areas were coded based on management agency and legal or administrative authority of designation.
6. As a component of our GAP analysis, we developed a system to describe the scale of conservation areas. We adapted the Tongass NF map of Value Comparison Units (VCU) as a general representation of watersheds for regional scale analysis. Conservation areas that protected entire VCUs were considered as watershed-scale protection. Conservation areas that do not protect entire watersheds such as small and medium old growth reserves under the TLMP, state marine parks, the Alaska Chilkat Bald Eagle Preserve and others were considered as sub-watershed reserves. All stand-level protections such as buffers on riparian areas, beach and estuary fringe forests under the TLMP and Alaska State Forest Practices Act were considered as stand-level conservation areas. The rationale was that a GAP analysis should consider the extent to which large, intact landscapes are conserved within the existing system of conservation in the region.
7. Completed GAP Analysis and Summary Report. As our retrospective analysis indicated, large-tree forests are the component of forest ecosystems that have been most impacted by logging activity, and as a consequence, our GAP analysis focused on the management status of this rare forest type. We evaluated the representation of big-tree forests within conservation areas among biogeographic provinces at 3 scales: watershed, sub-watershed reserves and buffers.

Significant Deviations *(if any, and explain the reasons for these):*

1. Our cursory GAP analysis of all ecosystem types indicated that coastal wetlands are under-represented within conservation areas in the region. These include marine and

estuarine types such as salt marsh, aquatic bed, rocky shore, tide flats, etc. Alaska Dept. of Natural Resources has primary responsibility for management of tidelands, but comprehensive GIS data on management of tidelands were not available. Thus, we were unable to evaluate whether these types are adequately represented within existing conservation areas. Development of GIS data on management status of tidelands from DNR Area Plans should be a priority for future work in the area, and would allow a regional of conservation representation of coastal wetland types.

Actual Costs during this Report Period *(personnel plus all operating expense totals)*:
(Reported costs included ADF&G indirect calculated at 13.5%)

Federal (from ADF&G):	Partner (nonfederal share):
$43,746	$14,952

Project Leader *(or Report Contact Person)*: Rob Bosworth

Additional Information: None